

We claim:

1. A modular ignition assembly for a vehicle having at least one door and at least one system operable by a key, the modular ignition assembly comprising:
 - a housing;
 - a key reader located at least partially within the housing, the key reader comprising
 - an antenna;
 - an RFID receiver coupled to the antenna and adapted to receive RFID signals from the key via the antenna, the RFID signals comprising a code used for authorizing operation of at least one system of the vehicle;
 - a processor coupled to the key reader to receive signals from the key reader responsive to RFID signals received by the RFID receiver; and
 - an RKE receiver located within the housing and adapted to receive RKE signals transmitted to the modular ignition assembly to unlock at least one door of the vehicle;wherein the housing, key reader, antenna, and RFID receiver comprise an assembly configured for mounting in a vehicle as a single integral unit.
2. The modular ignition assembly as claimed in claim 1, wherein the antenna is coupled to the RKE receiver to receive RKE signals.
3. The modular ignition assembly as claimed in claim 1, wherein the antenna is a first antenna, the modular ignition assembly further comprising a second antenna coupled to the RKE receiver to receive RKE signals from a remote source.
4. The modular ignition assembly as claimed in claim 1, wherein the RKE receiver is adapted to receive RKE signals transmitted to the modular ignition assembly from a fob.
5. The modular ignition assembly as claimed in claim 1, wherein the key reader, antenna, and processor are located at least partially within the housing.

6. The modular ignition assembly as claimed in claim 5, wherein the key reader, antenna, and processor are located on a common circuit board.
7. The modular ignition assembly as claimed in claim 5, wherein the key reader, antenna, and processor are located within a common electronics enclosure of the vehicle access module.
8. The modular ignition assembly as claimed in claim 1, wherein the antenna and RFID receiver are located on a common circuit board.
9. The modular ignition assembly as claimed in claim 8, wherein the RKE receiver is also located on the common circuit board.
10. The modular ignition assembly as claimed in claim 8, wherein the process is also located on the common circuit board.
11. The modular ignition assembly as claimed in claim 1, wherein the antenna is at least partially located in a wall of the housing.
12. The modular ignition assembly as claimed in claim 1, further comprising a lock cylinder located at least partially within the housing and shaped to removably receive a part of the key therein.
13. The modular ignition assembly as claimed in claim 1, wherein the lock cylinder has a plurality of tumblers releasably engageable with a coded surface of the key.
14. The modular ignition assembly as claimed in claim 1, wherein the RFID receiver is part of an RFID transceiver coupled to the antenna and configured for two-way communication with a receiver of the key.
15. The modular ignition assembly as claimed in claim 1, wherein the RKE receiver is part of an RKE transceiver, and communicates with a source of the RKE signals.

16. The modular ignition assembly as claimed in claim 1, further comprising a tire pressure monitor circuit located at least partially within the housing and adapted to receive signals representative of tire pressure of at least one vehicle tire.

17. The modular ignition assembly as claimed in claim 1, further comprising a remote starter circuit located at least partially within the housing and adapted to receive at least one wireless signal representative of a command to start the vehicle.

18. The modular ignition assembly as claimed in claim 1, further comprising a window control circuit located at least partially within the housing and adapted to receive at least one signal representative of a command to move at least one vehicle window.

19. The modular ignition assembly as claimed in claim 1, further comprising:
an ignition switch; and
a lock located at least partially within the housing and actuatable to prevent the ignition switch from being placed in at least one state.

20. The modular ignition assembly as claimed in claim 1, further comprising a steering column lock having a lock bolt received at least partially within the housing in a position of the lock bolt.

21. A method of assembling a vehicle ignition and access assembly operable by a key, the method comprising:
- providing a housing;
 - coupling an antenna to an RFID receiver, the RFID receiver adapted to receive RFID signals from the key via the antenna, the RFID signals comprising a code used for authorizing operation of at least one system of the vehicle;
 - installing a key reader at least partially within the housing, the key reader comprising the antenna and the RFID receiver;
 - coupling the RFID receiver to a processor adapted to receive signals from the key reader responsive to RFID signals received by the RFID receiver; and
 - installing an RKE receiver in the housing;
- wherein the housing, key reader, antenna, and RFID receiver comprise an assembly configured for mounting in a vehicle as a single integral unit.
22. The method claimed in claim 21, wherein installing the key reader includes inserting the key reader at least partially into the housing.
23. The method claimed in claim 21, wherein installing the key reader includes molding at least part of the antenna into the housing.
24. The method claimed in claim 21, further comprising coupling the antenna to the RKE receiver to receive RKE signals.
25. The method claimed in claim 21, further comprising coupling another antenna to the RKE receiver to receive RKE signals.
26. The method claimed in claim 21, wherein the RKE receiver is adapted to receive RKE signals transmitted to the modular ignition assembly from a fob.

27. The method claimed in claim 21, further comprising installing the processor within the housing, wherein the housing, key reader, antenna, RFID receiver, and processor comprise an assembly configured for mounting in a vehicle as a single integral unit.
28. The method claimed in claim 27, wherein the RFID receiver, the antenna, and the processor are mounted on a common circuit board.
30. The method claimed in claim 27, wherein the RFID receiver, the antenna, and the processor are located within a common electronics enclosure of the vehicle ignition and access assembly.
31. The method claimed in claim 21, wherein the antenna and RFID receiver are mounted on a common circuit board, the method further comprising inserting the common circuit board at least partially into the housing.
32. The method claimed in claim 31, wherein the RKE receiver is also mounted on the common circuit board.
33. The method claimed in claim 31, wherein the processor is also mounted on the common circuit board.
34. The method claimed in claim 21, further comprising molding the antenna at least partially within the housing.
35. The method claimed in claim 21, further comprising inserting at least part of a cylinder lock within the housing, the cylinder lock shaped to receive a portion of the key.
36. The method claimed in claim 35, wherein the lock as a plurality of tumblers releasably engageable with a coded surface of the key.

37. The method claimed in claim 21, wherein the RFID receiver is part of an RFID transceiver coupled to the antenna and configured for two-way communication with a receiver of the key.
38. The method claimed in claim 21, wherein the RKE receiver is part of an RKE transceiver configured for two-way communication with a source of RKE signals.
39. The method claimed in claim 21, further comprising installing a tire pressure monitor circuit at least partially within the housing and adapted to receive signals representative of tire pressure of at least one vehicle tire.
40. The method claimed in claim 21, further comprising installing a remote starter circuit at least partially within the housing and adapted to receive at least one wireless signal representative of a command to start the vehicle.
41. The method claimed in claim 21, further comprising installing a window control circuit at least partially within the housing and adapted to receive at least one signal representative of a command to move at least one vehicle window.
42. The method claimed in claim 21, further comprising:
coupling an ignition switch to the housing; and
coupling a lock to the housing, the lock actuatable to prevent the ignition switch from being placed in at least one state.
43. The method claimed in claim 21, further comprising coupling a steering column lock to the housing.

44. A modular ignition assembly for a vehicle having at least one door and at least one system operable by a key, the modular ignition assembly comprising:
- a circuit board;
 - a key reader coupled to the circuit board, the key reader comprising
 - an antenna;
 - an RFID receiver coupled to the antenna and adapted to receive RFID signals from the key via the antenna, the RFID signals comprising a code used for authorizing operation of at least one system of the vehicle;
 - a processor coupled to the key reader to receive signals from the key reader responsive to RFID signals received by the RFID receiver; and
 - an RKE receiver coupled to the circuit board and adapted to receive RKE signals transmitted to the modular ignition assembly to unlock at least one door of the vehicle;
- wherein the circuit board, key reader, antenna, and RFID receiver comprise an assembly configured for mounting in a vehicle as a single integral unit.
45. The modular ignition assembly claimed in claim 44, wherein the antenna and RFID receiver are mounted upon the circuit board.
46. The modular ignition assembly claimed in claim 45, wherein the processor is mounted upon the circuit board.
47. The modular ignition assembly claimed in claim 45, wherein the RKE receiver is mounted upon the circuit board.
48. The modular ignition assembly claimed in claim 44, wherein the processor is mounted upon the circuit board.
49. The modular ignition assembly claimed in claim 48, wherein the RKE receiver is mounted upon the circuit board.

50. The modular ignition assembly claimed in claim 44, wherein the antenna is coupled to the RKE receiver to receive RKE signals.
51. The modular ignition assembly as claimed in claim 44, wherein the antenna is a first antenna, the modular ignition assembly further comprising a second antenna coupled to the RKE receiver to receive RKE signals from a remote source.
52. The modular ignition assembly as claimed in claim 44, wherein the RKE receiver is adapted to receive RKE signals transmitted to the modular ignition assembly from a fob.
53. The modular ignition assembly as claimed in claim 44, further comprising a housing within which each of the key reader, the antenna, and the processor are at least partially received.
54. The modular ignition assembly as claimed in claim 53, wherein the key reader, antenna, and processor are mounted to the circuit board.
55. The modular ignition assembly as claimed in claim 53, wherein the key reader, antenna, and processor are located in an electronics enclosure of the housing.
56. The modular ignition assembly as claimed in claim 44, further comprising a housing within which each of the antenna and the RFID receiver are at least partially received.
57. The modular ignition assembly as claimed in claim 56, wherein the RKE receiver is also located at least partially within the housing.
58. The modular ignition assembly as claimed in claim 56, wherein the processor is also located at least partially within the housing.
59. The modular ignition assembly as claimed in claim 44, wherein the antenna is located at least partially within a wall of the housing.

60. The modular ignition assembly as claimed in claim 44, further comprising a lock cylinder shaped to removably receive a part of the key therein.
61. The modular ignition assembly as claimed in claim 60, wherein the lock cylinder has a plurality of tumblers releasably engageable with a coded surface of the key.
62. The modular ignition assembly as claimed in claim 44, wherein the RFID receiver is part of an RFID transceiver coupled to the antenna and configured for two-way communication with a receiver of the key.
63. The modular ignition assembly as claimed in claim 44, wherein the RKE receiver is part of an RKE transceiver, and communicates with a source of the RKE signals.
64. The modular ignition assembly as claimed in claim 44, further comprising a tire pressure monitor circuit on the circuit board and adapted to receive signals representative of tire pressure of at least one vehicle tire.
65. The modular ignition assembly as claimed in claim 44, further comprising a remote starter circuit located on the circuit board and adapted to receive at least one wireless signal representative of a command to start the vehicle.
66. The modular ignition assembly as claimed in claim 44, further comprising a window control circuit located on the circuit board and adapted to receive at least one signal representative of a command to move at least one vehicle window.
67. The modular ignition assembly as claimed in claim 44, further comprising:
an ignition switch; and
a lock coupled to the circuit board and actuatable to prevent the ignition switch from being placed in at least one state.

68. The modular ignition assembly as claimed in claim 67, further comprising a steering column lock, wherein the circuit board, key reader, antenna, RFID receiver, and the steering column lock comprise an assembly configured for mounting in a vehicle as a single integral unit.

69. A method of assembling a vehicle ignition and access assembly operable by a key, the method comprising:

providing a circuit board;

coupling an antenna to an RFID receiver, the RFID receiver adapted to receive RFID signals from the key via the antenna, the RFID signals comprising a code used for authorizing operation of at least one system of the vehicle;

coupling the antenna and RFID receiver to the circuit board;

coupling the RFID receiver to a processor coupled to the circuit board and adapted to receive signals from the RFID receiver responsive to RFID signals received by the RFID receiver; and

coupling an RKE receiver to the circuit board;

wherein the circuit board, antenna, and RFID receiver comprise an assembly configured for mounting in a vehicle as a single integral unit.

70. The method as claimed in claim 69, further comprising mounting the antenna and RFID receiver upon the circuit board.

71. The method as claimed in claim 70, further comprising mounting the processor upon the circuit board.

72. The method as claimed in claim 70, wherein coupling the RKE receiver to the circuit board comprises mounting the RKE receiver upon the circuit board.

73. The method as claimed in claim 69, further comprising mounting the processor upon the circuit board.

74. The method as claimed in claim 73, wherein coupling the RKE receiver to the circuit board comprises mounting the RKE receiver upon the circuit board.
75. The method as claimed in claim 69, further comprising inserting the antenna within a housing of the vehicle ignition and access assembly.
76. The method as claimed in claim 69, further comprising molding the antenna within a housing of the vehicle ignition and access assembly.
77. The method claimed in claim 69, further comprising coupling the antenna to the RKE receiver to receive RKE signals.
78. The method claimed in claim 69, further comprising coupling another antenna to the RKE receiver to receive RKE signals.
79. The method claimed in claim 69, wherein the RKE receiver is adapted to receive RKE signals transmitted to the vehicle ignition and access assembly from a fob.
80. The method claimed in claim 69, further comprising installing the RFID receiver, the antenna, and the processor in a common housing of the vehicle ignition and access assembly.
81. The method claimed in claim 80, further comprising receiving the RFID receiver, the antenna, and the processor within a common electronics enclosure of the housing.
82. The method claimed in claim 69, further comprising installing the RFID receiver and antenna within a common housing of the vehicle ignition and access assembly.
83. The method claimed in claim 69, further comprising molding the antenna at least partially within a housing of the vehicle ignition and access assembly.

84. The method claimed in claim 69, wherein the RFID receiver is part of an RFID transceiver coupled to the antenna and configured for two-way communication with a receiver of the key.

85. The method claimed in claim 69, wherein the RKE receiver is part of an RKE transceiver configured for two-way communication with a source of RKE signals.

86. The method claimed in claim 69, further comprising coupling a tire pressure monitor circuit to the circuit board, the tire pressure monitor circuit adapted to receive signals representative of tire pressure of at least one vehicle tire.

87. The method claimed in claim 69, further comprising installing a remote starter circuit on the circuit board, the remote starter circuit adapted to receive at least one wireless signal representative of a command to start the vehicle.

88. The method claimed in claim 69, further comprising installing a window control circuit on the circuit board, the window control circuit adapted to receive at least one signal representative of a command to move at least one vehicle window.

89. The method claimed in claim 69, further comprising:
coupling an ignition switch to the circuit board; and
providing a lock actuatable to prevent the ignition switch from being placed in at least one state.